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HINTS ON ERADICATION OF BIG SAGEBRUSH (ARTEMISIA TRIDENTATA) BY CHEMICAL SPRAYING AND BY BURNING[1/]

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Every year thousands of acres of sagebrush land are treated mechanically, burned, or sprayed with chemicals to control sagebrush. These hints are not to weigh the merits of different methods of eradication, but merely to help those who plan chemical spraying or burning of sagebrush.

Chemical Spraying

Spraying with 2,4-D, 2,4,5-T, and other chemicals has been successfully used on undesirable weeds and brush. Success with controlling sand sagebrush in Oklahoma and other locations led to much optimism regarding control of big sagebrush. Most of the early sprayings on big sagebrush were failures. But because spraying seemed to promise low cost and speed it was decided that studies were needed. Three studies were started in the spring of 1949: One near Lander, Wyoming, in cooperation with the Bureau of Land Management; one near Craig conducted by Colorado A & M College; and one near Delta conducted by the Rocky Mountain Forest and Range Experiment Station. While the recommendations below are drawn from the results of all of these studies and from other regions, they are for the most part results from the 1949 sprayings near Lander where the Bureau of Land Management and the Rocky Mountain Forest and Range Experiment Station sprayed 69 plots in 1949 and 117 plots in 1950. Fourteen 5-acre plots were sprayed by airplane. A total of 162 1-acre plots were sprayed by a ground spray-rig mounted on a Caterpillar tractor. Different types and amounts of chemicals and carriers were tested on different dates. The following recommendations are preliminary and are intended for use by those who want to try chemical spraying on a small scale. Further studies will provide more definite recommendations.

Date of spraying is one of the most important factors for a good kill of sagebrush. Best kills result when the plants are growing vigorously and the twigs are from one-fourth to three-fourths full grown and before the seedstalks have commenced growth. Near Lander this was the middle to the

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1/ Prepared for two field days demonstrating machinery for sagebrush eradication and conducted by the Colorado Extension Service at Wellcott on October 25 and at Cimarron on October 27, 1950.

2/ Maintained by the United States Department of Agriculture, Forest Service, in cooperation with Colorado A & M College.

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last of May. Bluegrasses were headed out but wheatgrass heads were not showing. At Eagle and Cimarron the optimum date would be the first to the middle of May, dependent upon plant growth for that season. At higher elevations spraying may be successfully done up until June 15.

Chemicals vary greatly. At present 1½ pounds of acid equivalent per acre of the butyl ester form (or some higher ester form) of 2,4-D is recommended. In purchasing 2,4-D be sure to check the acid equivalent on the label. It is the acid which kills plants. 2,4-D with an acid equivalent of 4 pounds per gallon is worth twice as much as 2,4-D with 2 pounds acid per gallon. 2,4,5-T and a mixture of 2,4-D and 2,4,5-T have sometimes given better sagebrush kills than 2,4-D. Where this is the case the lower cost of 2,4-D often makes it more economical to use more of this chemical than to use less of the more costly 2,4,5-T. 2,4-D should cost about $1.25 per pound of acid and 2,4,5-T about $3.50.

Carriers. Five gallons of Diesel oil and 5 to 10 gallons of water per acre as a carrier for the 2,4-D acid have given good results. Spraying the entire plant is important. One plot sprayed twice to get a thorough coverage with a total of 1½ pounds of 2,4-D per acre resulted in 97 percent kill of the plants.

Methods and cost of spraying. The cost of spraying, together with topography and other factors, will determine the method to use. Airplane and ground spraying give much the same results. Assuming a large area, the cost of chemicals and application for ground spraying should cost about $3.00 per acre and airplane spraying $1.75 to $2.25 per acre. For small acreages the airplane might cost twice this amount and ground spraying still cost only $3.00.

Effect upon other vegetation. Grasses are not damaged and usually increase in vigor and volume to replace the dead brush. Rabbitbrush is sometimes killed back for 1 year but grows again. Most broadleaved shrubs and weeds growing with sagebrush are affected. Some are killed and some just die back for 1 season.

Precautions to observe in chemical spraying:

1. Do not spray sagebrush on winter ranges and other areas where it is used for browse.

2. Do not spray where valuable weeds and brush growing with the sagebrush will be killed.

3. If reseeding is to follow, remember that dead standing brush is still a problem.

Burning

Controlled burning is the cheapest method of sagebrush eradication. Costs average about 35 cents per acre for burning blocks of one section. Burning provides an excellent seedbed where no further treatment is needed prior to drilling. Remember that fire may be either a useful tool or a deadly enemy. Some precautions to observe in burning are as follows:

1. Notify fire control officers of burning plans.

2. Burn in late summer or early fall when a clean burn can be obtained.

3. Provide an adequate fire guard 30 feet wide, with an additional 200-foot burned-out strip.

4. Do not burn steep slopes or sandy soils where erosion is likely to follow.

5. Do not burn where there is considerable rabbitbrush or other undesirable weeds or shrubs which sprout from the roots.

6. Do not allow any trailing or grazing on burns for 1 to 2 years following burning.

7. Where there is a poor grass understory, follow with drilling the year of the burn.

For further information on burning sagebrush see "Sagebrush Burning--Good and Bad," U. S. Department of Agriculture Farmers' Bulletin #1948.

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